

Amendment under 37 CFR §1.111  
Attorney Docket No.: 052267  
Application No.: 10/528,265

**REMARKS**

Claims 4-13 are pending in the present application. Claims 4-7 are withdrawn from consideration. Claims 8 and 9 are herein amended. Claims 1-3 are herein cancelled. Claims 10-13 are newly added.

**Claims Rejections – 35 U.S.C. § 103**

Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Li** (US 6,911,129); and claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over **Fuller** (US 3,121,078) in view of **Li**. Claims 1-3 have been cancelled. Withdrawal of these rejections is requested.

Claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Li**. Favorable reconsideration is requested.

**(I)** Applicants respectfully submit that **Li** does not teach or suggest:

a mask; and

a means for moving the mask in one direction on a straight line above or beneath a substrate;

wherein said mask has a periphery orthogonal to said straight line, and a first and a second openings,

said first opening has a first edge making an angle of 30° to said straight line, said second opening has a second edge making an angle of -30° to said straight line

as recited in claim 8 and similarly recited in claim 9, and that these features would not have been obvious.

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The Office Action takes the position that mask 58 of Li corresponds with the recited mask. (Office Action, page 5.) The Office Action also cites nozzle slits 85A-C for corresponding with the recited mask periphery, the first edge of a first opening in the mask and a second edge of a second opening in the mask. (Office Action, page 5.) Mask 58 is a part of the embodiment of Fig. 4 in Li and nozzle slits 85A-C are part of the embodiment of Figs. 8 and 9 of Li. Thus, the Office Action appears to take the position that it would have been obvious to combine these two embodiments in Li. The Office Action does not provide an explanation of why it would have been obvious to combine these two embodiments.

Applicants first note that nozzle slits 85A-C do not correspond with a periphery of a mask, and first and second openings of a single mask as alleged by the Office Action. Nozzle slits 85A-C are individual attachments located at the exits of vapor source chambers and are like “garden hose nozzles” in which movement of a small flow obstruction changes the spread of water that issues from the hose. (Col. 7, lines 26-39.) Thus, since the cited nozzle slits 85A-C are independent and individual attachments for each respective vapor source, nozzle slits 85A-C cannot be interpreted as parts of a single mask.

Second, assuming nozzle slits 85A-C correspond with the periphery, and first and second edges of first and second openings of a single mask as alleged by the Office Action, the nozzle slits 85A-C do not move relative to the substrate 81, and thus do not form a movable mask. Li discloses that nozzle slits 85A-C are arranged over respective edges of a triangle so as to surround substrate 81. (Fig. 9.) Li discloses that the nozzle slits are arranged independently and

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a throat associated with the slit produces a desired flow rate that varies in a controllable manner with an angle  $\theta$ . (Col. 7, lines 26-39.) Thus, nozzle slits 85A-C do not form a movable mask.

The Office Action cites mask 58 in Fig. 4 as a mask that is movable in a uniaxial direction. (Office Action, page 5.) Mask 58 in Fig. 4 does not have first and second openings with first and second edges, and thus, the Office Action appears to take the position that it would have been obvious to combine the embodiment of Figs. 8 and 9 with the embodiment of Fig. 4.

Applicants respectfully submit that it would not have been obvious to one of ordinary skill in the art to combine these two embodiments. The embodiment of Fig. 4 and the embodiment of Figs. 7-9 are two different and independent “approaches” to the invention in Li. (Col. 7, lines 26-28.) Adding nozzle slits to the exits of vapor sources in Fig. 4 of Li would not produce the effect as illustrated and described regarding the embodiment of Figs. 7-9 because in Fig. 4, the vapor sources exit into pre-disposition chamber 56 where the different vapors mix. (Col. 5, lines 61-65.) The intended effect of the nozzle slits is to control and change the spread or the relative flow rate that varies with an angle  $\theta$  on the substrate. (Col. 7, lines 26-39.) This effect would not be achieved when the vapor sources exit into a pre-disposition chamber 56.

Moreover, even if the two embodiments are combined, the combination of nozzle slits 85A-C, which are attachments at the exits of the vapor source chambers, and mask 58 would not provide a single mask which moves in one direction having a periphery edge and two openings, each with a respective edge.

Therefore, the present invention as recited in claims 8 and 9 would not have been obvious based on Li because (1) Li does not disclose a single mask which moves in one direction having

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a periphery edge and two openings, each with a respective edge; (2) it would not have been obvious to combine the embodiment of Fig. 4 with the embodiment of Figs. 7-9; and (3) even if the two embodiments are combined, the modified device still would not have a single mask which moves in one direction having a periphery edge and two openings, each with a respective edge.

(II) Applicants respectfully submit that Li does not teach or suggest:

when said means for moving moves said mask above or beneath said substrate, the movement of said periphery determines a film thickness gradient of a first material, the movement of said first edge determines a film thickness gradient of a second material, and the movement of said second edge determines a film thickness gradient of a third material, thereby a ternary phase diagrammatic system thin film is deposited on said region of equilateral triangle in said substrate

as recited in amended claims 8 and 9, and that this feature would not have been obvious.

The Office Action cites nozzle slits 85A-C as corresponding with the recited mask periphery, the first edge of a first opening in the mask and a second edge of a second opening in the mask. (Office Action, page 5.) However, Li does not disclose that nozzle slits 85A-C move. In other words, there is no moving means for moving nozzle slits 85A-C such that the movement of each nozzle slit determines the film thickness gradient for each component. In Li, the nozzle slits control and change the spread or the relative flow rate that varies with an angle  $\theta$  on the substrate. (Col. 7, lines 26-39.) The nozzle slits do not move to form film thickness gradients.

The Office Action combines movable mask 58 of the embodiment of Fig. 4 with nozzle slits 85A-C. As stated above, one of ordinary skill in the art would not combine these two embodiments as explained above. However, even if these two embodiments are combined, a

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ternary phase diagrammatic system thin film would not be formed. As stated above, adding nozzle slits to the exits of vapor sources in Fig. 4 of Li would not produce the effect as illustrated and described regarding the embodiment of Figs. 7-9 because the vapor sources exit into pre-disposition chamber 56 where the different vapors mix. (Col. 5, lines 61-65.)

**(III)** Applicants respectfully submit that Li does not teach or suggest:

    said periphery has a length which is sufficiently large relative to a region of equilateral triangle in said substrate;

    each of said first and second edges has a length which is sufficiently large relative to said region of equilateral triangle in said substrate

as recited in claims 8 and 9.

In Fig. 9 in Li, when the three nozzle slits 85A-C and the substrate 81 are compared, the slit width of the nozzle slits 85A, 85B, and 85C (the shorter length in the figure) are substantially equal to one edge of the substrate 81.

In the present invention, each of the single action edges 11a, 11b, and 11c in the mask 10 shown in Fig. 1 is longer than one edge of the triangle 12a of the substrate 12 (namely, the region where the thin film of ternary phase-diagrammatic system is formed). The present invention explains in paragraph 31 that “the single action edges 11a, 11b, and 11c have their lengths each of which is sufficiently large relative to a region of equilateral triangle 12a in the substrate 12 on which a thin film of ternary phase-diagrammatic system is to be formed.”

### **New Claims**

New claims 10-13 recite similar mask limitations as in claims 8 and 9. Thus, argument (I) above is also applicable to these claims. In addition, claims 10 and 11 recite:

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said periphery has the length which is sufficiently large relative to a region of equilateral triangle in said substrate,

said first opening has the size which is sufficiently large relative to said region of equilateral triangle in said substrate,

said second opening has the size which is sufficiently large relative to said region of equilateral triangle in said substrate.

As shown in Fig. 1 of the present invention, the first and the second openings are larger than the triangle on the substrate 12 (the region where the thin film of ternary phase-diagrammatic system is formed). (Relating to Claims 10 and 11.) Li neither teaches nor suggests these features.

For at least the foregoing reasons claims 8-13 are patentable over the cited references. Accordingly, withdrawal of the rejection of claims 8 and 9 is hereby solicited.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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